

NOTES ON THE CLUSIACEAE - CHIEFLY OF PANAMA. II.

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These notes constitute the second in my report on a preliminary review of Panama Clusiaceae, most of the material of which has been placed in my hands by the authorities of the herbarium of the Missouri Botanical Garden on behalf of a treatment of the family for the Flora of Panama.

The following notations are offered with names of taxa in alphabetical sequence.

1. Clusia coclensis Standley, Ann. Mo. Bot. Gard. 27: 321. 1940.

Type. Shrub 1-1/2 m, flowers white, vicinity of El Valle, Panama, 800-1000 m alt, 5 Sept 1938, Paul H. Allen 771 (holotype F, isotype MO).

Distribution. Usually a small tree or shrub, upland forests, sometimes of more open areas; Panama: Provinces of Chiriquí, Coclé, Panamá, and, doubtfully, San Blas.

PANAMA. Chiriquí: epiphytic shrub in cloud forest, trees to 5 m tall, 500-5500 ft alt, lower montane rain forest N of San Felix at Chiriquí-Bocas del Toro border, on Cerro Colorado copper mine road along continental divide, 5 May 1975, Mori & Kalunki 5944 (NY). Coclé: 5 Sept 1938, Allen 771 (holotype F, isotype MO); laticiferous shrub, fruits green, cloud forest on slopes of Cerro Pilon near El Valle, 10 Jun 1967, Duke 12114 (NY, MO); small tree 5 m high, ♀, latex scanty, clearish becoming sugary, leaves thickly coriaceous, pale beneath, fruit globose, less than 1 cm long, beak about 1 cm, styles 4, very short, stigmas spreading, La Mésa, Cerro Gaital, 3 mi NW of El Valle, 9 Nov 1967, Maguire & Maguire 61498 (NY); bushy tree 6 m high, ♀, latex moderate, yellowish, leaves sessile, fruit globose, flask-shaped, commissural lines slightly depressed, whitish, styles short, 5(6), sepals 2 pairs, La Mésa, Cerro Gaital, 3 mi NW of El Valle, 9 Nov 1967, Maguire & Maguire 61499 (NY); common shrub, latex scanty, fruits green, said to be an important bird food, elfin forest, Cerro Caracoral, ca 1000 m alt, 19 Jan 1968, Duke & Dwyer 15073 (NY); small tree with clearish scanty latex, occasional in low wet bush, La Mésa, 6 km above El Valle, 18 Jan 1975, Maguire & Huang 65520 (NY). Panamá: shrub to 3 m, fruits green, white striped, cloud forest, Cerro

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Jefe, 19 Aug 1967, Elias & Hayden 1805 (NY). San Blas: epiphytic tree, in primary forest along newly cut road from El Llano to Carti-Tupile, continental divide to 1 mi from divide, 300-500 m alt, 30 Mar 1973, Liesner 1263 (MO). This specimen is questionably assigned to Clusia coclensis.

2. Clusia dichrophylla Standley, Field Mus. Pub. Bot. 22: 159. 1940.

Type. Tree or shrub 10-15 ft, flower white, rain forest, crest of Cana-Cuasi Trail, Chepigana District, Darién, Panama, 1500 m alt, 15 Mar 1940, M. E. & R. A. Terry 1565 (holotype F, isotype MO).

Known only by the type collection. The specimen is inadequate for any resolution of status.

3. Clusia fructiangusta Cuatrecasas, Rev. Acad. Colomb. Cienc. 8: 33. 1950.

Type. Costa del Pacífico, Isla del Guayabal, en la desembocadura del río Cajambre, 0-5 m alt, Dept. del Valle, Colombia, 11-12 Feb 1944, José Cuatrecasas 16206 (♂ holotype COL, isotype NY). Cotype. ♀, same data, Cuatrecasas 16202 (COL, NY).

Distribution. Coastal Colombia and Ecuador, and Prov. Panama, Panama.

PANAMA. Panama: epiphytic tree, tepals whitish pink, 16 km above Pan-American Highway on road from El Llano to Carti-Tupile, tropical wet forest, 13 Feb 1973, Kennedy, Dressler & Mahler 2430 (MO); epífita, flores blancas-celestes, látex, camino de Llano a Carti, aproximadamente entre los 14 a 18 kms de la carretera a Chepo, 400 m alt, 20 Feb 1973, Correa, Dressler, Carrasquilla & Mendieta 1871 (MO); epiphytic shrub, flower buds bluish-gray, petals brown, flowers scarcely fragrant, road to Carti [San Blas], 19 km N of El Llano, 500 m alt, 13 Mar 1973, Busey 903 (MO, NY incomplete); hemiepiphyte, buds pale pink, wet forest, 350 m alt, El Llano-Carti Road, 12.7 km from InterAmerican Hwy, 15 Feb 1975, Mori, Kallunki & Gentry 4700 (MO).

This well marked and handsome species is assigned to the section Retinostemon by Cuatrecasas, associated particularly to the "type" Diplandro of Pl. & Tr.

COLOMBIA. Nariño: small tree, ♀, latex white, moderate, stems hexagonal, petals 4, pink with maroon bases, fruit 7-8-celled with 7-8 rotate sessile stigmas, penicillate, 5 cm long, 5-7 mm wide, 300 m alt, 14 km past Barbacóas along road to

Pasto, 18 Oct 1969, Maguire & Maguire 61864 (NY); tree to 15 m, ♂, stems hexagonal, latex white, petals 4, deep rose with maroon bases, inflorescence erect, ultimate branches reflected, 400 m alt, 15 km past Barbacóas along road to Pasto, 18 Oct 1969, Maguire & Maguire 61865 (NY, 2 sheets); tree 5 m high, ♂, stems hexagonal, petals 4, deep rose with maroon bases, latex white, inflorescence erect, ultimate branches reflected, 500 m alt, 20 km past Barbacóas on road to Pasto, 18 Oct 1969, Maguire & Maguire 61867 (NY). Valle: 11-12 Feb 1944, Cuatrecasas 16206 (holotype COL, isotype NY); ♀, same data, Cuatrecasas 16202 (cotype COL, NY); epiphytic shrub on tall tree, Agua Clara, along highway from Buenaventura to Cali, 100 m alt, dense forest, 6 Jun 1944, Killip & Cuatrecasas 38897 (COL, US).

ECUADOR. Esmeraldas: tree to 25 m, petals deep rose, primary forest along river banks near Playa Grande, Cayapa River, 29 Jun 1966, Jativa & Epling 1050 (NY, UCLA); liana, primary tall forest at Tobar Donoso, junct. of Rio San Juan and Rio Camumbi, 150 m elev, 25 Jul 1966, Jativa & Epling 1121 (NY).

4. Clusia lineata (Benth.) Planchon & Triana, Ann. Sci. Nat. 13: 345. 1860.

Triplandron lineatum Bentham, Bot. Voy. Sulphur, London, 1844-46, p 73, pl 28. Type. Tumaco, [Nariño], Colombia, "Hinds 1841" (holotype K, isotype K); San Pedro, Colombia, "Hinds 1841" (Syntype K).

Clusia seemanni Planchon & Triana, Ann. Sci. Nat. 13: 347. 1860, Triplandron lineatum Seemann, Bot. Herald 88. Type. Baie du Choco, Chocó, Colombia, Seemann (P).

Clusia cruciata Cuatrecasas, Rev. Acad. Colomb. Scienc. 8: 37. 1950. Type. La Trojita, 5-50 m alt, Rio Calima (region del Chocó), Dept. Valle, Colombia, J. Cuatrecasas 16575 (F).

Clusia lineata is a variable plant in habit, leaf size, and environmental latitude. Mori & Kallunki 6136 and Lewis et al 2116 of Bocas del Toro represent the form with largest leaves and the most northern range. They also demonstrate to some extent altitudinal accommodation. Lewis et al is noted on the label as a "parasitic shrub;" Mori & Kallunki as a "tree, 4 m tall."

Plants from the Chocó region, Colombia, seem to represent most frequently the epiphytic phase. This form is represented by

Cuatrecasas 16575 (16574), the type of Clusia cruciata, a series of collections made by Duke, and a series of specimens obtained by Maguire & Maguire, all of which are here cited. It is probable that Cl. seemanni Pl. & Tr. of the "Baie du Choco" belongs here.

A series of collections from the vicinity of Tumaco, Nariño, Colombia, the type locality of Clusia lineata, collected by Maguire & Maguire, indicate that plants from the area are terrestrial, shrubs or small trees, or are facultatively epiphytic.

Klug 3292, of Moyabamba, San Martín, Peru, at 1100-1600 m alt, a shrub of 3 m, represents the most southerly range and possibly the highest altitude recorded for this variable species. Maguire & Maguire 61761, of Puyo, Pastaza, Ecuador, of 1300 m alt, is another southern and high altitude collection.

Distribution. PANAMA. Bocas del Toro: tree 40 ft, flowers white, Fish Creek Mts., vic Chiriquí Lagoon, 23 Apr 1941, von Wedel 2295 (MO); parasitic shrub to 4 m, petals pinkish red, sticky, strong vanilla fragrance, Chiriquicito to 5 mi S along Río Guarumo, rain forest by river, 5-7 Jun 1967, Lewis et al 2116 (NY). Darien: "matapalo," flowers white with red, between Quebrada Venado and Peje Swamp on the headwaters of Río Tuqueza, 28 Jun 1967, Bristan 1004 (MO); woody epiphyte at least 5" dbh, fruits green, latex white, Río Morti, Drill Site 7 (986 x 185), 15 Sept 1967, Duke 14129 (MO). Panamá: Canal Zone, Madden Dam area, Boy Scout Road, 23 Jul 1968, Dwyer & Lallathin 8825A (MO). Veraguas: tree 4 m tall, petals white, NW of Santa Fe, 11 km from Escuela Agrícola de Piedra, in valley of Río Dos Bocas, Atlantic slope, 450-550 m alt, 17 May 1975, Mori & Kalunki 6136 (NY).

5. Clusia longipetiolata Schery, Ann. Mo. Bot. Gard. 29: 326. 1942.

Type. Vicinity of Chiriquí Lagoon, alt near sea-level, Bocas del Toro, 12 Oct 1940, H. von Wedel 1136 (holotype MO).

Distribution. Only two collections of this fine euclisioid have come to my attention, viz, that of the type, obtained by von Wedel, and that, later, obtained by Croat.

PANAMA. Bocas del Toro: Chiriquí Lagoon, 12 Oct 1940, von Wedel 1136 (holotype MO). Colón: tree 10 m, flowers white, sap white, with adventitious roots to 3 m, Miguel de la Borda, forest near beach and coconut plantation, 24 Apr 1970, Croat 10011 (MO, NY).

6. Clusia multiflora H.B.K., Nov. Gen. et Sp. V. 200. 1822.

Clusia multiflora H.B.K., in the broad liberal sense, extends from Mexico in the cordilleran axis to Bolivia and the Venezuelan coastal Andes. It would be the chief defining species of the section Anandrogyne, as circumscribed by Planchon and Triana (1860), for which to date there have been more than 35 specific names proposed, the chief authors being Humboldt, Bonpland and Kunth 3 species, Planchon and Triana 12, Vesque 3, and Cuatrecasas 14 taxa. There would, in addition, be several from other authors.

The degree of replication of prominent features within the section, covering so extended an area geographically, is subtle and complicated. To provide a clarification of the intra-sectional deviation and relationship will require an intensive detailed study. This extended study cannot be accomplished at the present writing so as to form a rational basis for the presentation of the clusias of Panama so included.

I must, therefore, adopt a most conservative approach and make assignments broadly within the multiflora-complex. Refinement of interpretation will have to follow at such time as the section can be studied in toto.

Clusia multiflora H.B.K. ssp scariosepala Maguire, ssp nov

Arbor terrestris ad 10 m alta; ramisculis crassis, subsucculentis, teretibus; foliis subsessilibus vel perbrevibus, laminis vulgo 20-25 cm longis, 12-15 cm latis, apicibus rotundatis, basibus acutis, costa subtus prominenti; venis primariis 3-4 mm apartis, ca 45° angulo adscendentibus; inflorescentiis masculinis compacto-cymosis, vulgo 9-12-floribus, pedunculo erecto, crasso, 3-4 cm longo; bracteis naviculoideis, carinatis, orbiculari-acutis, ca 15 mm longis; sepalis 3-jugis, orbicularibus, 12-14 mm longis, valde scario-marginatis; petalis 6, anguste oblanceolatis (?), ca 2 cm longis; staminibus numerosis, 3-4 mm longis, in corona brevi instructis, antheris linearibus, ca 3-4 mm longis, obtusis, lateraliter dehiscentibus; pistillo rudimentali nullo vel minimo; granis pollinis sphaeroideis, vel aliquantum subalato-sphaeroideis, ca 20 u diam, sporodermate reticulato; inflorescentiis foemineis vulgo 6-9-floribus, compactis, pedunculis 3-8 cm longis; sepalis 3-jugis, 12-18 mm longis, late orbicularibus vel late ovatis, valde albo-scariosis; petalis 6; staminodiorum filamentis apparenter 6, ca 8-10 mm longis, alternatis carpellis, ovatis, 2-3 cm longis, valde styloso-cornutis, stylis ad 1 cm longis, recurvatis; stigmatibus ovatis, ca 2 mm longis, extrorsis; seminibus non-visis.

Type. Frequent, small tree, in temperate forest at 2200-2400 m alt, La Carbonera, 25 km NW Ejido, Estado Mérida, Venezuela, 19 Oct 1953, Bassett Maguire 39446 ♂ (holotype NY).

Distribution. Possibly of restricted range, montane forests, 2200-2600 m alt, Estado Mérida, Venezuela.

VENEZUELA. Estado Mérida: arbol, "Tampaco," Cerro de las Flores, 2000-2100 m alt, 26 Abr 1953, Bernardi 444 (NY); small tree, frequent, temperate forests at 2200-2400 m alt, La Carbonera, 25 km NW Ejido, 19 Oct 1953, Maguire 39445 ♂ (NY); 19 Oct 1953, Maguire 39446 ♂ (holotype NY); frequent, small tree, conspecific with 39445 and 39446, temperate forests at 2200-2400 m alt, La Carbonera, 25 km NW Ejido, 19 Oct 1953, Maguire 39447 ♀ (paratype NY); arbol de 12 m alto, frutos con hendiduras longitudinales bien pronunciadas, La Mucuy, 2600 m alt, Agos 1958, Aristeguieta 3318 (NY); bosque nublado, Bosque San Eusebio, La Carbonera, 2250-2600 m alt, 1971, Veillon 18 (NY).

The subspecies scariosepala constitutes an obvious phase of the highly polymorphic and genetically plastic Clusia multiflora-complex. It is presented here because of its strong superficial resemblance to Clusia perscariosa of Panama, but with which it has no immediate or sectional relationship.

7. Clusia odorata Seemann, Bot. Voy. Herald, p 89. 1853.

Type. Boquete, Veraguas [Chiriquí], Panama, Feb 1869, Berthold C. Seemann 1638 (holotype K).

Distribution. Small trees or shrubs, or facultative often massive epiphyte, in open woodland or abandoned pasture lands, commonly at 1000 to 3000 ft altitude. Of frequent occurrence in north and central Panama, the range most probably extending into Costa Rica.

PANAMA. Chiriquí: Boquete, Feb 1869, Seemann 1638 (holotype K); tree 20-25 ft, on llanos, leaves thick, Chiriquí Viejo Valley, 22 Apr 1938, White 86 (MO, F); tree 15 to 20 ft, 8-10" diam, on llanos, 3 mi from Paso Ancho, strong sweet perfume resembling orange blossoms, tree in open sunlight, very dry habit, Rfo Chiriquí Viejo Valley near El Volcán, 24 Jul 1938, P. White 189 (MO, F); epiphytic shrub becoming a strangler, flowers pale pink, 21 Aug 1940, Seibert 1539 (MO); tree 15-20 ft, flowers white, Boquete, Bajo Mono, 4000 ft alt, 28 Nov 1940, Terry & Terry 1647 (F); shrub 15 ft, buds white flushed with delicate pink, fruits green, exploding, seeds red, Tolé, vic

Santa Ana Well, ca 1000 ft alt, thicket on hillside paralleling brook, 1 Aug 1967, Dwyer & Kirkbride 7459 (MO); tree to 25 ft, buds white, llanos bordering creek, Boquete, Llanos Francia, 4 mi from Boquete toward Dolega, 4500 ft alt, 6 Aug 1967, Dwyer & Hayden 7603 (NY); much branched tree to 10 m high, ♂, latex cream-yellow, on overhanging cliffs at Horqueta, 27 Oct 1967, Maguire & Maguire 61463 (NY); much branched tree, ♀, latex cream-yellow, petals 6-7, broadly obovate, 2 cm long, 18 mm broad, stigmas sessile, fruit oblong, on overhanging cliffs at Horqueta, 27 Oct 1967, Maguire & Maguire 61464 (NY); much branched rounded tree to 8 m, ♂, latex cream, sepals 3 pairs, white, petals 6, fragile, white, suffused with pink at base, 3 mi from Boquete, 27 Oct 1967, Maguire & Maguire 61465 (NY); ♂, 8 mi from Boquete, 27 Oct 1967, Maguire & Maguire 61468 (NY); epiphytic, buds green, flowers tan-brown, tetramerous, caducous, mature fruits green with brown verrucae, ca 2 cm diam, on Chiriquí Trail, cloud forest between Quebrada Hondo and Divide, 20 Apr 1968, Kirkbride & Duke 931 (NY, MO); tree 4 m tall, 6" dbh, Nueva Suissa near Audubon Society Cabin, 1750 m alt, 12 Sept 1972, Gentry 5984 (MO). Darién: woody plant with fruit green, Manené to the mouth of the Río Cuasi, 28 Apr 1968, Kirkbride & Bristan 1501 (MO). Panamá, Canal Zone, Barro Colorado Island: tree to 40 ft, petals rose, 24 Jan 1968, Dwyer 8443 (MO); tree 3 m, flowers rose-white, fruits green, north end of Orchid Isle, 23 Sept 1968, Croat 6327 (MO); tree, probably epiphytic, about 2 m high, growing to near surface of water, flowers pink to red, few remaining on tree, sap yellowish, shoreline of cove southwest of Slothia Island, 13 Jan 1969, Croat 7204 (MO); tree 4-6 m, common on rocky shelf of deepest part of cove, flowers pinkish, fruits green, shoreline, large cove of Pena Blanca Point, 3 Mar 1969, Croat 8376 (MO); epiphytic tree 3 m, petals white to pink, bright red at base, sap yellow, shoreline of large cove S of Orchid Island, 15 Feb 1971, Croat 13478 (MO); epiphytic tree at 25 m, trunk to 12 cm dbh, with yellowish sap becoming orange in time, flowers white, Zetel Trail at Conrad Trail, 12 Jun 1971, Croat 14957 (MO); petals white with pink tips, tree along shore, point east of dock, 1 Oct 1971, Gentry 1987 (MO).

The Costa Rican form appears to represent epiphyte habit solely. In the Province of Chiriquí, Panamá, most plants seem, as indicated by collectors' data, to be shrubs or small trees. Southward through Panamá north of the Canal Zone, and in Darién, the species is facultatively epiphytic or terrestrial, and seems to grade into Clusia cruciata Cuatrecasas and Clusia lineata (Benth.) Pl. & Tr., these forms extending southward from Chocó, Colombia, to Esmeraldas, Ecuador.

8. Clusia palmana Standley, Field Mus. Pub. Bot. 18: 705. 1937.

Type. In a meadow, 1600 m alt, La Palma, Prov. San José, Costa Rica, Paul C. Standley 32906 (holotype US).

Distribution. Tree 10-20 m high, frequently of cut-over forests at 1500-2300 m, often a facultative epiphyte, Nicaragua to Costa Rica. One collection from Panama is assigned questionably to this species.

PANAMA. Coclé: tree 12 m high, ♂, latex scanty, oxidizing yellow, La Mésa, Cerro Gaital, 3 mi NW of El Valle, 9 Nov 1967, Maguire & Maguire 61497 (NY).

9. Clusia perscariosa Maguire, sp nov

Arbor epiphytica, saepe magna; ramulis subsucculentis, aliquantum angulosis sed non alatis; foliis subsessilibus vel brevibus, laminis coriaceis, vulgo 20-30 cm longis, 12-18 cm latis, late oblanceolatis, apicibus late rotundatis, basibus acutis, costa prominentibus subtus, venis primariis ca 2 mm apartis, ca 45° angulo adscendentibus; inflorescentiis masculinis subcompacto-cymosis, vulgo 9-15-floribus, pedunculo recurvato, crasso, 3-4 cm longo, bracteis primariis conspicuis, subfoliaribus, ad 3 cm longis; sepalis 3-jugis, orbicularibus, 12-14 mm longis, marginibus albo-perscariosis; petalis 6, oblanceolatis, albidis; androecio compacto, ca 10-12 mm diam, multistaminibus, filamentis ca 1 mm longis, subcompressis, antheris linearibus, ca 4 mm longis, lateraliter dehiscentibus, abrupte brevimicronatis apicibus connectivorum; pollinibus tricolporatis, sphaeroideis, ca 24 u diam, sporodermate valde coni-papillato; inflorescentiis foemineis ut videtur 3-9-floribus; sepalis 3-jugis, orbicularibus, 12-14 mm longis, marginibus albo-perscariosis; petalis 6; corona androecii brevi, dentiformibus; ovario 8-9-loculari, ovulis pluribus; stigmatibus ovalibus, sessilibus; apice ovarii plano nudo; capsula plusminusve globosa, valde sulcata; seminibus non-visis.

Type. Epiphytic tree, petals white in bud, wet forest, 350 m alt, El Llano-Carti Road, 21.1 km from Inter American Highway, Prov. Panamá, Panama, 20 Mar 1975, S. Mori & J. Kallunki 5108 (holotype MO, isotype NY).

Distribution. Low altitude rain forest. Collected only in the Llano-Carti area.

PANAMA. Darién: tree, base sometimes reaching ground, flowers pink, stamens yellow, summit of Cerro Pirre, cloud

forest, 1000-1400 m alt, 29 Dec 1972, Gentry & Clewell 7032 (MO). Panamá: epífita, látex, flores blancas, camino de Llano a Cartí, aproximadamente entre los 14 a 18 kms de la carretera a Chepo, alt 400 m, 20 Feb 1973, Correa, Dressler, Carrasquilla & Mendieta 1850 (MO); epiphytic tree, calyx pale green, petals cream-white, faint pink tinge, sap white, 19 km above Pan-Am Highway on road from El Llano to Carti-Tupile, 200-500 m alt, 20-21 Feb 1973, Kennedy 2526 (MO); epiphytic tree, petals light green, waxy, filaments thick, pale green, leaves thick, fleshy, yellow-green below, 16-20 km above Pan-Am Highway on road from El Llano to Carti-Tupile, 400 m elev, 28 Feb 1973, Kennedy 2712 (MO); 3 meter epiphyte, primary forest, along newly cut road from El Llano to Carti-Tupile, 12 mi above Pan-Am Highway, 200-500 m alt, 13 Mar 1973, Liesner 687 (MO); epiphytic tree, buds white, wet forest, 350 m alt, El Llano-Carti Road, 12.7 km from Inter-American Highway, 15 Feb 1975, Mori & Kallunki 4704 (MO); epiphytic tree, petals white in bud, wet forest, 350 m alt, El Llano-Carti Road, 21.1 km from Inter-American Highway, 20 Mar 1975, Mori & Kallunki 5108 (holotype MO, isotype NY).

Clusia perscariosa cannot be assigned to the section Anandrogyne even though it is superficially similar to Clusia multiflora ssp scariosepala, properly placed in that section. The latter is non-epiphytic (? obligately so), the stigmas are borne on conspicuous cornute styles, and the pollens are sectionally typical and are not provided with a strongly papillose exine as is prominently characteristic of Clusia perscariosa. This species must be studied further to permit sectional assignment.

Again it should be pointed out that Clusia perscariosa, although bearing a strong superficial resemblance to Clusia multiflora ssp scariosepala of the Venezuelan Andes, there is no immediate relationship between the two taxa.

10. Clusia salvinii J. Donnell Smith, Bot. Gaz. 35: 1. 1903.

Clusia salvinii seems to represent the northernmost element of the Multiflorae, and, itself variable, may in the future have to come within Clusia multiflora. For the present, however, there is insufficient information in hand for such a resolution.

Now, it seems useful to offer the var cupulata because of its most distinctive androecial corona of the pistillate flower (which seemingly does not occur in the var salvini),

and more particularly to invite further field population studies to determine consistency of character, and to identify the corresponding and probably coincident male partner.

Too, attention should be called to a large leaved variant, the formal status of which is obscure to me at this time.

Clusia salvinii Donn. Sm. var salvini

Type. Volcán de Fuego, 2600 m alt, Dept. Zacatepéquez, Guatemala, Oct 1873, Osbert Salvin s n.

Distribution. Ranging from tropical Mexico to Darién, Panama, and there with numerous individuals transitional to Clusia multiflora, which has extensive range and variability (see above).

In much of its range the var salvini exhibits much variability in facies, but more or less consistency in critical floral and fruit characters. Only a few citations are here made so as to indicate the quality of exomorphic variability.

Typical specimens, i e specimens consistent with type: GUATEMALA. Volcán de Fuego, 2600 m alt, Oct 1873, Salvin s n. PANAMA. Bocas del Toro: Kirkbride & Duke 985 (MO, NY). Coclé: Maguire & Huang 65517, 65518, 65519 (to be distributed, MO, NY, and elsewhere); Maguire & Maguire 61495 (also to be distributed) is transitional to the next, the large leaved form.

Clusia salvinii Donn. Sm. var salvini, large leaved form

Distribution. Throughout the range of "typical" var salvini, and possibly of more common occurrence.

Selected specimens: PANAMA. Coclé: Duke & Dwyer 15093 (MO, NY); Kirkbride 1093 (MO, NY); Maguire & Maguire 61502, 61503 (to be distributed). Panamá: Gentry 2870 (MO); Dwyer et al 5030 (MO). Darién: Kirkbride & Duke 1283 (MO, NY).

Clusia salvinii Donn. Sm. var cupulata, var nov

Var salvini simili, sed floribus foemineis cum corona cupulata profunde ad 8 mm instructa, cupula maturitatem cadente; petalis ca 2 cm longis; floribus masculinis non-visis.

Type. Hemiepiphytic tree, flower white, brownish at base of

petals, stigma yellow, style white, tropical wet forest, 2.1 km N of main road, 15.0 km E of Cerro Azul village, 700-800 m alt, 5 Jan 1975, Cerro Jefe, Altos de Pacora region, Rio Diablo at Jimenez Finca, Prov. Panamá, Panamá, A. Gentry & Scott Mori 13407 (holotype MO).

Distribution. Recorded only from the provinces of Panamá and Colón, as follows:

PANAMA. Colón: tree to 6 m, petals white, waxy looking, fruit red-pink, stigmatic surface black, along river bank, near Peluca, Km 25.6 from Transisthmian Highway on the road to Nombre de Dios, upstream on tributary to Rio Boqueron, 25 Feb 1973, Helen Kennedy 2679 (MO). Panamá: tree 7 m tall, hard as hell, petals white, 7 mi N Cerro Azul on road to Cerro Jefe, at 2600 ft, 13 Nov 1965, Blum, Godfrey & Tyson 1797 (MO); tree, Goofy Lake, ca 2 mi above Goofy Lake toward Cerro Jefe, 16 Aug 1967, Dwyer & Stimson 8062A (MO); Cerro Campana, 8 Apr 1972, A. Gentry 5058 (MO); tree with milky sap, flowers white, nectiferous, road to Carti (San Blas), 15.5 km north of El Llano, rain forest, 400 m alt, 13 Feb 1973, Busey 367 (NY, MO); epiphytic shrub 3 m tall, buds pink and white, petals white, stigma yellow, sticky, flowers sweetly fragrant, premontane wet forest, along new El Llano-Carti road, 8-12 km N of El Llano, 400-450 m alt, 12 Dec 1973, Nee, Gentry & Dressler 8782 (MO); hemi-epiphytic tree, flowers white, brownish at base of petals, stigma yellow, style white, ovary brown, Cerro Jefe, Altos de Pacora region, Rio Diablo at Jimenez Finca, 700-800 m alt, tropical wet forest 2.1 km N of main road, 15.0 km E of Cerro Azul village, 5 Jan 1975, Gentry & Mori 13407 (holotype MO); epiphytic shrub, buds white, fruit pink, along road 18.9 km N of Cerro Azul, 8 Mar 1975, Mori & Kallunki 4999 (MO); Mori & Kallunki 4545 (MO).

The more southern var cupulata seems to be distinctly set off from the mostly broadly interpreted var salvinii by the conspicuous androecial cup and the larger petals of the pistillate flowers. Adequate association of staminate plants can be established only by careful population studies. It may well be that the var cupulata extends more northward within the entire range of var salvinii. With this information in hand, it may well be that the var cupulata would require elevation to specific status.

11. Clusia stenophylla Standley, Field Mus. Pub. Bot. 4: 235. 1929.

Type. Tree 25 ft by 4 in, petals white, flowers fragrant, yellow sticky sap from twigs, Bocas Island, Bocas del Toro,

Panama, Jan-Mar 1928, G. Proctor Cooper 468 (holotype F, isotype NY).

Distribution. Known certainly only by the type collection.

12. Tovomitopsis allenii Maguire, sp nov

Arbor ad 25 m alta; ramulis teretibus; foliis petiolaribus, petiolis vulgo 10-18 mm longis; laminis subcoriaceis, ellipticis, saepe late ellipticis, obtusis vel saepe abrupte brev-acuminatis, venis lateralibus, plus minusve 12-15, basi obtusis; inflorescentiis terminalibus, multifloribus, paniculato-cymosis, ad 8-10 cm longis; floribus masculinis: sepalis 4, subdecussatis, exterioribus brevibus, primo vulgo 1 mm longo, secundo vulgo 3 mm longo; interioribus concavis, ca 4 mm longis, scario-marginatis; petalis 5, oblongo-ovalibus, 6-7 mm longis; staminibus numerosis, multi-seriatis; filamentis teretibus, liberis, androphoro 1 mm alto instructis, antheris albidis, ca 0.3-0.5 mm longis, 2-lobatis, deltoideo-subcordatis, lateraliter dehiscentibus, connectivo breviter projecto; granis pollinis sphaeroides, tricolporatis, ca 25 u diam, evidenter foveolatis; nec floribus foemineis nec fructibus visis.

Type. Tree 50 ft, flowers white, Robalo Trail, northern slopes of Cerro Horqueta, 6000-7000 ft alt, Prov. Bocas del Toro, Panama, 5-7 Aug 1947, Paul H. Allen 5014 (holotype NY, isotype MO).

Distribution. Only two collections of this well marked species have been seen, both from Cerro Horqueta and both staminate.

PANAMA. Bocas del Toro: tree 50 ft, flowers white, northern slopes of Cerro Horqueta, 6000-7000 ft alt, 5-7 Aug 1947, Allen 5014 (holotype NY, isotype MO). Chiriquí: tree 75 ft, flowers white, Bajo Mono-Robalo Trail, 5000-7000 ft alt, western slopes of Cerro Horqueta, 27 Jul 1947, Allen 4839 (NY, MO).

Tovomitopsis allenii is the largest species of the genus known to me, reaching, according to the astute collector Paul Allen, some 75 feet in height. It will have to be compared to and distinguished from the other species when a review of the genus is made. Its firm leaves and large flowers make it conspicuous within the genus.